

## A-5 Pilot with Flight Control Attachments

### PILOTS INSTRUCTIONS

1. If a separate inverter is used for the A-5 pilot, turn on by means of switch on the pedestal.
2. Turn selector switch to pilot position, turn altitude control switch to off position.
3. Turn master switch to position 1, wait 20 seconds. Place both sticks in detent position.
4. Turn master switch to position 2, wait at least 3 minutes.
  - a. During this 3 minute interval, trim ship for "hands off" operation. Also, check A.C. voltage and frequency (110 to 120 volts, 380 to 420 cycles ).
5. After at least 3 minutes in position 2, turn rudder and elevator switches on, then turn master switch to position 3.
6. The altitude control may now be turned on, if desired.
7. The A-5 pilot is now fully engaged, and the human pilot may change the attitude of the airplane with the flight control sticks.

(Note: When the A-5 pilot is first turned on, the stick on the pilot's side of the cockpit is operative.)

The button on the top of the stick is the change-over switch. After the A-5 pilot is fully engaged, these buttons may be used to give either the pilot or co-pilot control of the plane, the button pressed last giving that corresponding stick control of the plane. It is not necessary to keep button depressed for stick to be operative.
8. The ship may be made to climb or dive by moving the stick in a fore or aft direction. If the stick is moved forward, the plane will descend, if moved backward, ascend, the rate of climb or dive being proportional to the movement of the stick.

When the stick is placed in detent, the altitude control is made operative (if the altitude control switch is on) and constant altitude will be hold. If a change in altitude is desired, it is only necessary to move the stick in the desired direction until the new altitude is reached, then placing stick back in detent. The altitude control will then hold the plane at this new altitude.
9. If the sticks are moved in an athwartship direction, a co-ordinated turn will be made in the direction of movement of the stick, the rate of turn being proportional to the displacement of the stick. Should the plane slip or skid while in a turn, the "bank angle" may be adjusted by means of the small knob on the stick until a co-ordinated turn is obtained.

*Note - Detent is Centered on Neutral position.*



FLIGHT CONTROL STICKS AND ATTACHMENTS  
FOR A-5 AUTOMATIC PILOT

The additions to the A-5 auto-pilot incorporated in the flight control unit are as follows:

1. An Emergency Release System. This system consists of a switch connected in parallel with the existing electrical release, operated by a cam on the elevator servo. If, when in flight while under A-5 control, the movement of the elevator surface exceeds a certain pre-determined (and adjustable) limit, the A-5 will be disengaged.
2. Automatic aligning. All three axis are aligned automatically by means of relays. This obviates the necessity of aligning and engaging one axis at a time, as is necessary with the conventional A-5 pilot. Thus, the elevator and rudder switches may be left "on" at all times, and all three axis engaged when the master switch is turned to position 3. One primary purpose for automatic aligning is to allow the human pilot to let the A-5 "idle" in position 2, then should he desire the help of the auto-pilot (should a motor be shot away, etc.), it is necessary only to turn the master switch to position 3.
3. Flight Control Sticks. These are miniature "joy sticks" which may be used, when the A-5 pilot is fully engaged, to change altitude or heading of the ship. The sticks are of the rate type, the rate of climb or rate of turn being proportional to the displacement of the stick. The maximum rate of turn obtainable with the present sticks is 120° per minute. There are two (2) sticks per plane, one (1) for pilot and one (1) for co-pilot, a small button being provided on the top of the stick to interchange control. The button pressed last gives that corresponding stick control of the plane. Also, a small lamp is mounted on each stick which indicates which stick is in operation.
4. An Altitude Control with Limiter is incorporated which is limited so that the maximum change in attitude of the plane is approximately 4 degrees. Thus, should an updraft or down-draft cause the ship to change altitude, the altitude control will bring the ship back to the reference altitude slowly, with no abrupt changes in the ships attitude.

This altitude control is operative when the altitude control switch is "on" and the stick is in detent. Whenever the stick is out of detent, the altitude control is inoperative, allowing the ship to ascend or descend. Thus, should the human pilot desire a change in altitude, it is only necessary to move the stick in the desired direction until the new altitude is reached, then place the stick back in detent. The altitude control will now hold the plane at this new altitude.